PROPOSAL FOR DIAGNOSTIC AND MITIGATION PLAN DESIGN for 89 Morris Street Morristown, NJ 07963

Prepared for:

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General Information

An investigation authorized by the Comprehensive Environmental Response, Compensation Act, 42 U.S.C. 9601 (CERCLA or the Superfund Law) has determined that the property at 89 Morris Street has been impacted by the intrusion of VOC vapors emanating from ground water and soil contamination related to the former VIP Cleaners. The indoor air contains elevated concentrations of tetrachloroethylene (PCE). There have also been higher concentrations of PCE identified beneath the concrete slabs. These concentrations exceed the acceptable health based concentrations.

EPA has determined that corrective action is required to mitigate the health based threats within the rental spaces. EPA is requiring a scope of work and work plan to comment upon and approve for the purpose of implementing remedial action

Testing and correcting the intrusion of soil contaminants in buildings is basically a four-step process: screening, diagnostic and design, mitigation installation and post remediation testing. EPA has already completed the initial steps of identifying and confirming the problem. The next steps are to identify how contaminants are entering the occupied building space and then design a mitigation plan.

What is the purpose of Building Diagnostics and a Remediation Plan?

The design of the mitigation plan is the most critical component in the entire process because it determines the remedial design and scope of work. This is the part that eliminates the *ad hoc* guess work and provides a defined plan. It also eliminates installing something that is not effective in reducing soil borne contaminants. Once a plan is in place, definite costs can be determined.

What are Building Diagnostics?

Entry of soil borne contaminants into a building is a result of three primary variables. The primary variables are (1) the source strength of radon in the soil; (2) entry routes; and (3) the convection forces that draw radon from the soil into the building. Quantifying and understanding the relationship between these three variables and the effect they have on the final contaminant concentrations is the key to developing an effective remedial plan. Testing indicates that these variables in their present state produce a problem. Proper diagnostics will provide us with the necessary information to manipulate the influencing factors and correct the problem.

Diagnostic Process

The first step is data collection. This involves a comprehensive examination of the heating system and defining how the HVAC system affects pressure within the individual rental units in the building. For example, the exhaust from the laundry process at the dry cleaners creates a very strong negative load on the interior of the building that accelerates the rate at which soil gases are drawn into the building.

The next step is to carefully catalogue all the contaminant entry points which would include sub slab conduit penetrations, stem walls, openings around heating system components, plumbing fixtures and other openings. Since pressure differentials between the soil and the building are the primary component in drawing soil borne pollutants into buildings. We will then determine the potential for soil depressurization. Soil depressurization will reverse or mitigate the entrainment process. Since the building is made up of several foundation areas, including sleeper floors, it is important to evaluate each of these areas individually in order to develop a comprehensive plan.

Discreet locations are selected and small holes are drilled through the floor slab in each foundation area. The physical characteristics of the sub slab material are recorded. Permeability tests are conducted to determine vacuum extensions for the purpose of soil depressurization. This is done by applying a known quantity of vacuum, approximately 20" water column (W.C.) to a primary suction point and using a micro-manometer to make pressure differential measurements. These measurements can be interpolated or extrapolated to project an expected radius of influence. The specific objective of this mapping is to specify a design that will provide a minimum coverage of a five pascals pressure differential between the indoor space and sub slab material with the slab itself being the defining barrier. It is anticipated that different foundation sections constructed at different times will have different types of sub slab fill material with varying permeability. Denser soils will require higher vacuum blowers and a greater frequency of suction points. Looser soils are easier to depressurize. Once sub slab vacuum fields have been determined and the negative pressure load applied by the exhaust appliances to each unit has been understood, a remediation plan can be developed.

How Do You Reduce Soil Borne Contaminants?

The primary method for reducing radon is active soil depressurization. This is accomplished by installing an active soil depressurization (ASD) system. An ASD system prevents soil borne contaminants from entering a building by creating a negative pressure beneath the slab. An ASD system will draw contaminants from beneath the slab, through PVC piping to the exterior of the building where it is vented above the roofline and quickly diluted with ambient air. The ASD system also removes moisture that can enter the building which improves the overall indoor air quality of the building.

What Does a Diagnostic Report Contain?

- General Information
- Contaminant Measurements
  - Soil Permeability Measurements
  - Vacuum Field Map
- Remediation Design
  - General Installation Requirements
- Scope of Remedial Work
  - Roof Penetrations
  - Sealing
  - Suction Hole Installation
  - PVC Pipe Installation
  - Blower Specifications
  - Blower Installation
  - Blower Wiring and Low Pressure Sensor

System Labeling
- Final Vacuum Test

Work Schedule

It is anticipated that the diagnostic work schedule will require two to three days of field time. The owner will need to provide access to all units. Because most of the units are used during normal business hours, we may have to work on the weekend or after normal business hours. The report will require approximately a week and a half to complete.

Historical Work

KEY PRINCIPALS

Thomas Hatton of Alpha Concepts is recognized as a pioneer of soil depressurization technology. Tom has twenty years of work experience in design, and installation management of soil depressurization systems, both in residential and commercial buildings.

KEY PROJECTS

As President of Alpha Concepts, Inc., Tom Hatton has participated in the installation of approximately 9,500 residential mitigation systems and approximately 50,000 tests in residential or educational structures. He has also served as measurement specialist for two additional radon businesses. Mr. Hatton served as an advisor to the New Jersey Department of Community Affairs providing critical input and comment to the Uniform Construction Code Radon Hazard Sub-code, Adopted Amendments N.J.A.C. 5:23 –10.1, 10.3 and 10.4. as referenced in the Summary of Public Comments. A review of the projects listed below will indicate that we are strongly qualified and experienced in design and installation of soil depressurization systems in buildings with similar construction styles.

XEROX CORP, BLAUVELT, NY PRESENT

Design and install Active Soil Depressurization systems to mitigate Vapor Intrusion of TCE and PCE in a former production facility that is currently being used as a distribution center.

LENNAR CORP, COLLEGE PARK, EDISON, NJ PRESENT

Design and install Active Soil Depressurization systems for the removal of VOC contaminants in 96 ninety-six residential dwellings.

VOC MITIGATION OF RESIDENTIAL STRUCTURES IN ROXBURY, NEW JERSEY, MAY 2006

Designed and installed vapor extraction systems to mitigate homes for the presence of Benzene and MTBE that were entering the home as a result of an underground storage tank leak. Basement contaminant levels are currently below, New Jersey health based screening values.

USEPA BUILDINGS, RARITAN ARSONAL EDISON, NJ 2005

Redesigned and Installed 16 multi-point Active Soil Depressurization systems in three separate buildings. Prior to installation the specified systems were redesigned to correct design deficiencies that would have created condensation problems. The first building is a 92,800 foot single story office and warehouse, the second and third buildings are multi-storied office buildings. All three buildings are constructed of steel, poured concrete, and brick. Post remediation Indoor VOC concentrations are below New Jersey health based screening values.

FAR HILLS COUNTRY DAY SCHOOL, FAR HILLS, NJ 2005-2006

Designed and Installing 13 multi-point Active Soil Depressurization systems in a multi-story private school in Far Hills, NJ. Building construction is steel, concrete block and brick.

MORRIS HILLS HIGH SCHOOL, ROCKAWAY, NJ 2005-2006

Installing 18 multi-point Passive Soil Depressurization systems in a three story public high school. Building construction is steel, concrete block and brick.

LAWRENCE TOWNSHIP SCHOOLS, LAWRENCE, NJ 2005

Designed and Installed 7 Active Soil Depressurization systems in two (2) two-story public school buildings in Lawrence Township, NJ. Building construction is two story steel, concrete block and brick.

LANGSTON HUGHES ELEMENTARY SCHOOL, EAST ORANGE, NJ 2005-2006

Installed 36 Soil Depressurization systems in a three-story public school in East Orange, NJ. Building construction is three story steel, concrete block and brick.

MOUNT VERNON ELEMENTARY SCHOOL, IRVINGTON, NJ 2005-2006

Design oversight and Construction Management, Installation of 14 Active Soil Depression systems. Building construction is two story steel, concrete block and brick.

HARRISON HIGH SCHOOL, HARRISON, NJ 2005-2006

Re-designed soil depression system for Harrison High School. Provided oversight, inspections and progress reports for twenty-five passive soil depression systems. Building construction is two story steel, concrete block and brick. The building is constructed over a brown field and the systems will be activated once pollutant levels are quantified.

REDBANK ELEMENTARY SCHOOL, WEST DEPFORD, NJ 2005

Provided remediation design and system installation for presence of radon gas. Building construction is one story steel, concrete block and brick.

E.H. BRYAN ELEMENTARY SHOOL, CRESSKILL, NJ 2005

Provided remediation design and system installation for presence of radon gas. Building construction is two story steel, concrete block and brick.

GLOUCESTER TOWNSHIP SCHOOLS, GLOUCESTER, NJ 2004

Designed soil depressurization systems and work plans for the Radon Remediation for Chews, Blackwood, and Gloucester Township Elementary Schools. Installed multiple point mitigation systems as per plan design. Building construction is two story steel, concrete block and brick.

MORRIS SCHOOL DISTRICT, MORRISTOWN, NJ 2004

Designed soil depressurization systems and work plans for the Radon Remediation for four (4) schools. Installed multiple point mitigation systems as per plan design. Building construction is two story steel, concrete block and brick.

U.S. POSTAL DISTRIBUTION CENTER BROOKLYN NY 2004

Designed multiple point soil depressurization and sub liner depressurization systems. Installed the mitigation systems as per plan design. This represents the largest sub liner depressurization system on record. Building construction is two story steel, concrete block and brick.

PHILLIPSBURG NATIONAL GUARD BUILDING, PHILLIPSBURG, NJ 2003

Designed soil depressurization systems and work plans for the Mitigation of the Phillipsburg National Guard OMS #15 Building. Installed the mitigation systems as per plan design. Building construction is World War II era, two story steel, concrete and triple walled brick.

NJDEP 2001

Principal Remediation Contractor to the NJDEP to install sub-slab soil depressurization systems to remove TCE from a building in Bergen County, NJ. Indoor air levels tested below cleanup criteria established by USEPA for TCE.

US EPA 1990

Principal Installation Contractor and Research Sub Contractor for Low-Permeability Fill Material Project. Evaluated ten buildings built over densely compacted fill and designed and installed soil depressurization systems. The documentation from this project is the main source of information for the EPA Handbook titled "Sub-Slab Depressurization for Low-Permeability Fill Material."

US PARK SERVICE 1989

Designed soil depressurization systems to correct indoor radon problems in historic buildings in Denali,
Alaska. The systems were designed to deal specifically with the problems associated with permafrost and underground utilidors. Utilidors are a network of tunnels that serve as a conduit to provide utilities such as phone, electric and hot water steam heat from a central boiler. These systems were installed in August of 1987 and radon levels in all building were lowered below 4.0 pCi/l.

FLORIDA HRS 1989

Provided consulting services to the Florida Office of Instructional Developments and the Department of Health and Rehabilitative Services to create a bank of test questions for the HRS Certification Exam for radon mitigators. Prior to performing radon remediation in the State of Florida, mitigators must pass this test. This bank of test questions provided the foundation for the US EPA Radon Contractor Proficiency Program exam as well as the NJ DEP Licensing exam for radon testers and mitigators.

US EPA 1988

Participated in a federally funded project to evaluate different instruments designed to sample radon and permeability of soils. This project included thorough diagnostics of buildings along with a complete characterization of soils beneath the slab and immediately surrounding the building. Soils were evaluated in several states. We found that geological conditions in the state of Florida allow soil gas sampling procedures to present the most relevant data toward correcting indoor levels in buildings.

US EPA 1987

Principal investigator in the 1987 Federal EPA Home Evaluation Program: performed diagnostic evaluations, radon and radon progeny analysis, charcoal canister and alpha track tests, designed and installed home specific mitigation systems based upon diagnostic information. The findings and recommendations were distributed by the EPA

and state agencies to over fifty homeowners in five states. Research data from this project was the basis for the current US EPA Course Manual "Reducing Radon in Structures."

US EPA 1987

Diagnosed and prepared remedial plans for the radium contaminated residential homes in Montclair, New Jersey when elevated indoor radon was measured in homes built on radium-contaminated soil. The soils beneath and immediately surrounding the basement were mapped for radon concentration and soil permeability. From these variables, energy efficient systems were designed, installed, and radon concentrations remain below EPA standards for corrective action.

US EPA 1985

Employed an air surveillance program for a US EPA Emergency Response program in Bowling Green, KY. Volatile and explosive vapors were emitted from ground fissures in the karsts system beneath the town. Emissions were mapped and qualified. Using rain, temperature and barometric variables, a mathematical model was developed to predict pollutant concentrations. This project marked the inception of soil depressurization technologies to remove soil based contaminates in and immediately surrounding buildings. At the January 2006 Air and Waste Management Vapor Intrusion conference Tom Hatton was cited as a contributing pioneer for his ground breaking work on this project.

REFERENCES

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THOMAS E. HATTON
132 Landing Road
Landing, NJ 07850

EXPERIENCE:

2001 to Present

Project Director, Radiation Data, Inc., Alpha Concepts division. NJDEP MIB 90016 and NJDEP MEB 90016. Responsible for system design and installation of commercial and residential soil depressurization systems. Management responsibilities include providing direction for of three to five ongoing commercial remediation projects and nine to fourteen residential remedial systems per week. Included is oversight of office staff, new business development and managing testing services and client report presentation.

1987 to 2001

President, Alpha Concepts, Inc. Hopatcong, NJ. NJDEP MIB 90049 and MEB 90049. Florida HRS licensed Radon Remediation Business and Florida HRS licensed Radon Measurement Business. Responsible for radon contract procurement, management of all major projects, and management of company assets, health and safety training, personnel exposure monitoring, mitigation system design.

1988 to 1993

Vice-President, Pineda Products, Inc., Melbourne, FL. Responsible for research and development of new radon gas detection instruments, distribution of a national sales catalog, presentation of technical papers featuring new equipment and diagnostic procedures.

1984 to 1988

Roy F. Weston, Inc., Atlanta, GA, & Edison, NJ. Member of Weston Project Management Team. Implemented health and safety plans, monitored well installations, performed geophysical earth logging and mapping, soil gas sampling, personnel supervision.

1984

Ardaman & Associates, Inc., Consulting Engineers, Sarasota, Fl. Assessed soil permeability and bearing strata, inspected foundation installations, structural steel, compression and flex testing of concrete and evaluated specific building materials against ASTM standards.

Presented seminars in radon diagnostics, radon mitigation procedures, quality assurance, ambient air monitoring, chemical spill response, hazardous waste sampling, and Federal Occupational Safety and Health Training compliance with 40 CFR 1910.

EDUCATION: B.S. Natural Science, Bryan College, Dayton, TN 1984

CREDENTIALS:
NJDEPE Certified Radon Measurement Specialist, MIS 10245
NJDEPE Certified Radon Mitigation Specialist, MES 10245
Radon Mitigation In Schools Certification, Cook College / US EPA
Hazardous Waste, Radiation Health and Safety Training – R.F. Weston,
Level B Site Safety Officer – R.F. Weston Company
Fundamentals of Hydrology Management, USEPA
President – Garden State Association of Radon Scientists and Technologists
Honorable Member of Who's Who in Executives and Professionals – 1994-1995
County Committee Member of Sussex County, NJ
Hopatcong Environmental Commission

KEY PROJECTS:

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Co-Managed ECRA closures of the Trenton, NJ U.S. Steel Plant where 2,000 cubic yards of contaminated soil were removed to construct an asphalt encapsulated drainage basin covering an area larger than one-quarter mile. Direct responsibilities included monitoring both personnel and ambient dust exposure. This project was featured as the cover story of the 1987 New Jersey ECRA Magazine.

Employed an air surveillance program for a US EPA Emergency Response program in Bowling Green, KY. Volatile and explosive vapors were emitted from ground fissures in the karsts system beneath the town. Emissions were mapped and qualified. Using rain, temperature and barometric variables, a mathematical model was developed to predict pollutant concentrations. This project marked the inception of soil depressurization technologies to remove soil based contaminates in and immediately surrounding buildings.

Participated in a federally funded project to evaluate different instruments designed to sample radon and permeability of soils. This project included thorough diagnostics of buildings along with a complete characterization of soils beneath the slab and immediately surrounding the building. Soils were evaluated in several states. We found that geological conditions in the state of Florida allow soil gas sampling procedures to present the most relevant data toward correcting indoor levels in buildings.